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ABSTRACT

Conducted on over 3,000 fourth, fifth, and sixth grade children in six states, this study documents changes in nutrition-related knowledge and behaviors which can be related to participating in the Mulligan Stew television series. This volume contains a summary of the findings of the study and recommendations. After participating in the series, youth demonstrated more knowledge about nutrition-related activities, and exhibited a dramatic increase in their awareness of 4-H. The series generated only minimal changes in the nutrition behavior of youth; while those who viewed the series appeared to eat more for breakfast, their selections from the basic food groups seemed to remain unchanged. After participating in the series, youth in all three grades tended to select fewer empty calorie items when given free choice on a menu containing a large number of foods. As measured by reading ability, the series worked well with both the good student and the poorer student. While the series appeared to be effective with youth in all three grades, overall the program had a somewhat stronger impact on fourth and fifth graders than it did on sixth grade youth. The comic workbook and viewing situation appeared to be important variables; although at-home viewing was good, in-school viewing generated larger changes; and while the series worked well without the comic workbook, Mulligan Stew was more effective with the comic. (RC)

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An Evaluation of the Mulligan Stew 4-H Television Series for Extension Service, USDA

TM006 026

Volume I · Executive Summary

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AN EVALUATION OF THE MULLIGAN STEW 4-H TELEVISION SERIES VOLUME I: EXECUTIVE SUMMARY

December 20, 1974

Principal Authors

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Prepared For

Extension Service, U.S. Department of Agriculture
4-H Youth Development Division

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Abt Associates Inc. and Extension Service, USDA gratefully acknowledge the help and assistance of county, district and state extension staffs of:

Arkansas
Missouri
Oregon
Pennsylvania
Tennessee
Texas

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PREFACE

On December 14, 1973, Abt Associates Inc. contracted with Extension Service, USDA, to conduct an evaluation of a 4-H television series on nutrition called Mulligan Stew. This six-part series, targeted to 4th, 5th, and 6th grade children, had been shown on local television stations across the nation during the year preceding the evaluation. While some states had conducted pilot studies or mini-studies on the impact of the series no controlled national field study had been applied. The present report describes such a study. Conducted on over 3,000 school-aged children in six states, the study documents changes in nutrition-related knowledge and behaviors which can be related to participating in the Mulligan Stew series. This final report is a description of the study and its findings.

The report consists of four volumes:

Volume I, the Executive Summary, focuses on findings and recommendations. This summary is organized to give the reader a quick overview of the main findings of the study.

Volume II, Report of the Study, is a detailed elaboration of the study findings as well as a description of study design, instrumentation and procedures.

Volume III, Case Studies, is a descriptive report of visits to the six study states to elicit information on the delivery system and costs associated with the program.

Volume IV, Documentation, is a reference volume containing all prior reports, submissions, computer printouts and supporting data for the study.

Many individuals contributed to this effort. At Abt Associates Inc. the contract staff included the following:

S. Shapiro, Project Director
R. L. Bale, Deputy Project Director
V. Scardino, Deputy Project Director

L. Abrams, Analyst
T. Cerva, Analyst
M. Conti, Analyst
K. Hewett, Analyst
D. Thomson, Analyst
J. Dwyer, Ph.D., Consultant
V. Horner, Ph.D., Consultant
A. Ziolkowski, Secretary

The core staff (Bale, Cerva, Scardino) has been associated with the project and has worked closely with the project director from the beginning. A team approach was maintained throughout; that is, the core staff was intimately involved in all aspects of the study. Each of them also took on specific responsibilities as well.

Dick Bale engineered the site selections and initial field visits as well as the double mailings required in the field effort. In addition, his conceptualization of the analytic approach served as the model for the specific analysis undertaken.

Vince Scardino had heavy input into the design of the instruments and was in charge of check-in, coding, and editing of the student pre- and post-test instruments.

Tom Cerva developed the prototype case study and was senior programmer for the impact evaluation. All computer runs other than the cross-tabulations were programmed and run by him.

Day Thomson, who joined the project for the case study visits, has acted as coordinator of the case studies as well as preparing statistical summary tables from the cross tabulations.

The staff with the able assistance of Ms. Ziolkowski has worked as a team in the writing and production of this final report. However, some concentration of effort was planned. Thus Vince Scardino focused on the Executive Summary; Ms. Thomson's efforts were primarily addressed to the Case Study volume; and T. Cerva, R. Bale, and S. Shapiro produced Volume II, Report of the Study. All products were reviewed by S. Shapiro, project director, before submission.

Evaluative research tends to be conducted by a study team. This study was no exception. What has been exceptional is the support and ongoing interest of the staff of Extension Service, USDA throughout the ten months of the study. Ms. Eleanor Wilson, project officer, and Drs. Evelyn Spindler and Claude Bennett, who worked with her as the Extension Service Committee on this project, were admirable colleagues in the effort. While Abt Associates Inc. must take final responsibility for this report, it owes much to the committee members, who functioned not only as reveiwers but as contributors at critical points during the contract period.

In addition, Ms. Wilson, through her personal diplomacy, smoothed the way for us and by so doing helped to keep the study on schedule. We are grateful for the experience of working so productively with Extension Service.

Sydelle Stone Shapiro

Sydelle Stone Shapiro, Ph.D.
Project Director

October 15, 1974

INTRODUCTION

In 1972 the USDA Extension Service produced a series of six half-hour TV shows designed to teach youth about nutrition. This 4-H TV series was produced as a component of the Expanded Food & Nutrition Program (EFNEP), and was called Mulligan Stew. Each of the six film productions depicts Mulligan and his friends, the Mulligan Stew gang, in a variety of situations dealing with nutrition. Each of the films emphasizes a different aspect of nutrition and is a self-contained unit. Yet basic nutrition concepts are identified and repeated throughout the entire series.

To supplement the six films, support materials were prepared. Materials for group leaders included suggestions for activities which would reinforce the message of the films. Materials for youth included a Mulligan Stew comic/workbook.

While the main goal of the series is to help youth acquire and apply nutrition knowledge, Mulligan Stew has several other objectives. These include increasing nutrition-related activities (e.g., shopping for food); and increasing youth's awareness of 4-H, an important secondary objective.

During the 1972-73 school year, the Mulligan Stew series was shown in classrooms, at 4-H clubs, on educational television, and on local commercial stations. But although limited research was conducted on the series, there was no broad-based evaluation designed to answer many important questions concerning the effectiveness of the series.

This report documents the results of a broad impact evaluation study of the effectiveness of the Mulligan Stew series, with suggestions for possible future TV projects for the Extension Service.

DESIGN OF THE STUDY

The evaluation was conducted in the early part of 1974 among more than 3000 youth in the 4th, 5th, and 6th grades in six states: Arkansas, Missouri, Oregon, Pennsylvania, Tennessee, and Texas. A pre/post experimental design was utilized, where the pre-wave of data was gathered just before youth began watching the Mulligan Stew shows, and the post-wave was conducted within a few days after the last show was televised. Arrangements for testing were made through schools by The State Extension Services. In order to gather information on the relative effectiveness of Mulligan Stew under different situations, a number of experimental groups (exposed to the films) and control groups (not exposed) were used. The following table summarizes the various experimental and control conditions and the total number of youth participating in each condition.

SUMMARY DESCRIPTION OF EXPERIMENTAL AND CONTROL GROUPS

	No. of Youth	
1. Watched Mulligan Stew IN-SCHOOL and Used the Comic Book	539	
2. Watched Mulligan Stew IN-SCHOOL, but Without Comic Book	482	
3. Watched Mulligan Stew AT-HOME and Used the Comic Book	398	
4. Watched Mulligan Stew AT-HOME, but Without Comic Book	404	
Total Experimental Group Youth.....		1,823
5. Control Group I did not watch Mulligan Stew and did not use Comic Book; Tested pre- and post	375	
6. Control Group II did not watch Mulligan Stew, and did not use Comic Book; Post tested only	373	
Total Control Group Youth.....		748
Total Youth Analyzed.....		2,571*

*It should be noted that although more than 3,000 children participated in either the pretest or post-test, a number of children were dropped from the data analysis because they were absent when either the pretest or the post-test was given.

The rationale for this design is as follows. The application of both pre- and post-viewing measurements to the experimental groups enables us to address the question of whether there are changes in the nutrition behavior, nutrition knowledge, attitudes and awareness of 4-H after viewing the Mulligan Stew series. Without this pretest/post-test comparison, there would be no defensible basis for assessing such change.

One of the control groups unexposed to the shows received both the pretest and post-test to provide the basic standard against which the changes observed in the experimental (exposed) groups could be compared. (Obviously, if these control youth demonstrated the same kinds and degree of change in nutrition-related activities, knowledge and attitudes as did the experimental groups, it would be impossible to conclude that viewing Mulligan Stew had caused these changes.)

The second type of control group -- those youth who did not see Mulligan Stew and who were tested only during the post-testing phase of the study -- protected against a different kind of problem. One might argue that the control youth who received the pretest were sensitized by pretesting -- that is, the pretest itself aroused sufficient curiousity in these youth to cause many of them to seek out correct answers to the knowledge test, etc. -- and thus would automatically improve on the post-test. This would reduce the apparent effectiveness of Mulligan Stew, when in fact it was the measurement process that caused spurious changes. (It may be noted that the Post Only Control data suggests that there wasn't any sensitization and therefore are not discussed separately in this volume.)

Each of the aforementioned groups contained approximately equal numbers of fourth, fifth, and sixth grade youth and, to the extent possible, the design was replicated in each of the six states used for the study. As can be seen in the following table, the experimental and control youth are well matched on most key demographic characteristics.

DEMOGRAPHIC CHARACTERISTICS OF EXPERIMENTALS AND CONTROLS (ALL GRADES COMBINED)

	Experimental Group	Pre/Post Control Group
(BASE: Sample Size = 100%)	(1,823)	(375)
SEX		
Male	51%	51%
Female	49	49
AGE		
9 or younger	12%	13%
10	30	24
11	31	34
12	21	25
13 or older	5	5
Not reported	1	-
READING LEVEL		
Below grade level	29%	35%
At or above grade level	65	56
Not reported	6	9
ESTIMATED ANNUAL FAMILY INCOME		
Under $5,000 per year	28%	25%
$5,000 - $10,000 per year	33	48
Over $10,000 per year	33	18
Not reported	6	7
ETHNIC/RACIAL		
White	62%	60%
Black	8	12
Spanish Surname	23	18
All others	1	1
Not reported	6	9

In the pre-testing and post-testing phases of the impact evaluation the children filled out test booklets which explored their knowledge of nutrition, their activities related to nutrition, and their awareness of and interest in 4-H. Additionally, children were asked on the post-test about their reactions to the Mulligan Stew films.

In order to answer the many questions around which the impact study was originally formulated, seven key outcome measures were constructed and analyzed for differences between various experimental and control youth. These seven outcome measures, listed below, will be discussed in the next chapter:

1) percent increase in nutrition knowledge
2) percent increase in nutrition-related behaviors
3) percent change to preference for adequate diets
4) percent reduction in preference ratio for empty calorie foods
5) percent change to eating breakfast
6) percent change to learning from peers
and 7) percent change in awareness of 4-H.

The statistical tool used in analyzing these data was the test of significance for a difference between proportions (percents)*. We used the 99% significance level for analyzing differences between the groups; that is, 99 times out of 100 the differences noted are real differences between the groups, (and are not due to chance variation).

As is the case with most research efforts, there are limitations in the data; trade-offs had to be made concerning the information which would be most helpful in answering important questions concerning Mulligan Stew's effectiveness within the budgetary and time constraints of the study. For example, this study can not make any direct statements concerning "Stew's" impact on 4-H groups since we were not able to locate such groups at each of the six sites that could participate in the experiment during the scheduled field dates. Also, time constraints prevented any long range impact to be assessed since our post testing of youth was conducted immediately after the sixth show. Thirdly, a proxy measure for nutrition behavior had to be utilized because of the prohibitive costs of actual observation of eating habits on a large scale. Further, no data was collected

*This test is described in J. Cohen's Statistical Power Analysis for the Behavioral Sciences (New York: Academic Press, 1969), on pages 174-206, and involves employing an arcsine transformation of the proportions, in order to normalize the distributions.

on the parents of the youth participating in the study because of budgetary considerations, even though it is recognized that the parents are important factors in a child's nutrition habits. Lastly, because of the difficulty of obtaining reliable income data from teachers about the child's family, our data analysis did not focus on detecting differences by family income. Thus the reader should recognize that this study cannot answer every question that might be conceivably asked about Mulligan Stew's impact.

While the main focus of the study was on the youth involved, there was also considerable interest in the effect of the series on the teachers. Thus information and reactions were sought from the teachers participating in the project.

In order to gather reactions from state Extension Service personnel who were involved in the delivery and distribution of the Mulligan Stew series, the research staff working on the project at Abt Associates made personal visits to the various program sites. The cost data gathered from each state did not undergo rigorous statistical treatment, but is presented in a descriptive analysis of the data.

And finally, in order to determine the strengths and weaknesses of the series and to suggest possible improvements, the entire package was subjected to a content analysis of each of its various components. This analysis is qualitative in nature, and contains criticisms and suggestions for future efforts.

The remainder of this volume contains a summary of the findings and recommendations made by Abt Associates on the Mulligan Stew project.

SUMMARY OF RESULTS

- **IMPACT FINDING -- OVERALL**

  THERE IS A POSITIVE IMPACT ON YOUTH WHO PARTICIPATED IN THE MULLIGAN STEW SERIES.

This overall finding on Mulligan Stew's impact is based upon our analysis of fourth grade, fifth grade, and sixth grade youth in each of the experimental on each of the seven outcome measures (described in the previous chapter). The table below summarizes our findings for all grades combined on the seven outcome measures, and demonstrates that "Stew" has an impact on youth in most, though not all, of the measurement areas. (Throughout this chapter an asterisk (*) has been used to indicate that the Experimental Group is significantly different from its corresponding control group at the 99% level of confidence.)

TABLE 1

SUMMARY TABLE OF STEW'S IMPACT[1)]

	Experimental Group (Participated in Mulligan Stew)	Control Group (Did Not Participate in Mulligan Stew)
Percent increase in nutrition knowledge from pre to post	27%*	5%
Percent increase in nutrition-related behaviors from pre to post	3%*	-4%
Percent change in preference for adequate diets from pre to post	19%	17%
Percent reduction in preference ratio of "empty calorie" to nutritious foods from pre to post	7%*	-3%
Percent change to eating breakfast from pre to post	53%*	35%
Percent change to learning from peers from pre to post	38%	27%
Percent change in awareness of 4-H from pre to post	59%*	24%

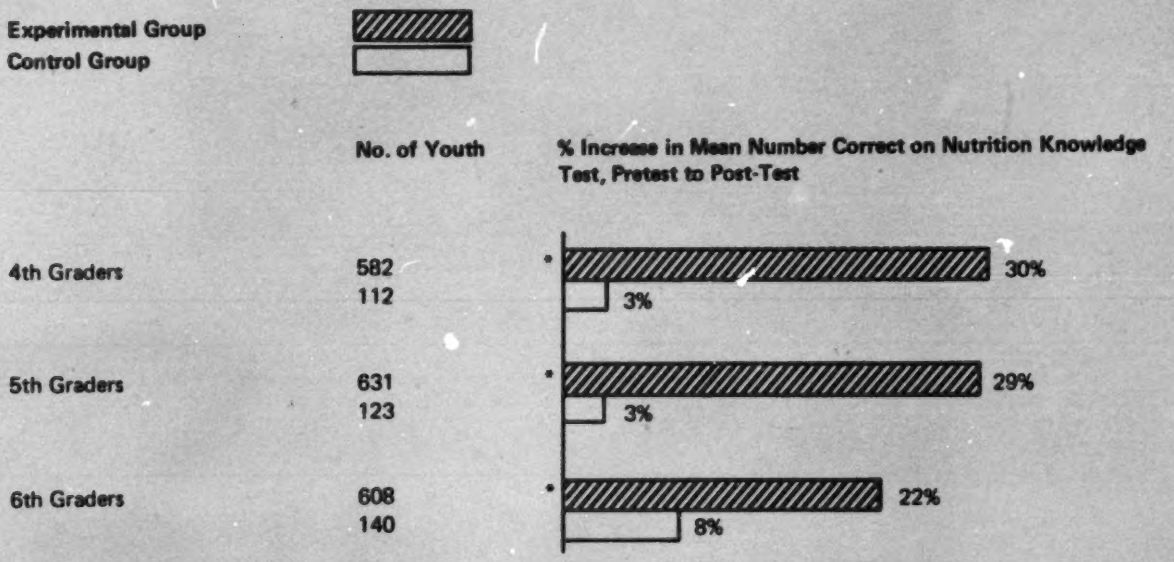
1) All data presented in this summary table combine all grades and thus have been adjusted to equalize the number of youth in each grade.

- IMPACT FINDING -- NUTRITION KNOWLEDGE

  MULLIGAN STEW IS HIGHLY EFFECTIVE IN INCREASING YOUTH'S KNOWLEDGE OF NUTRITION.

The outcome measure for this impact area -- the percent increase from pretest to post-test in the mean number of correct answers to the general nutrition knowledge questions -- is displayed in Chart I below. As can be readily seen in this chart, all grades show dramatic increase in knowledge, as compared to that of the control groups not exposed to the films.

CHART I. INCREASE IN NUTRITION KNOWLEDGE

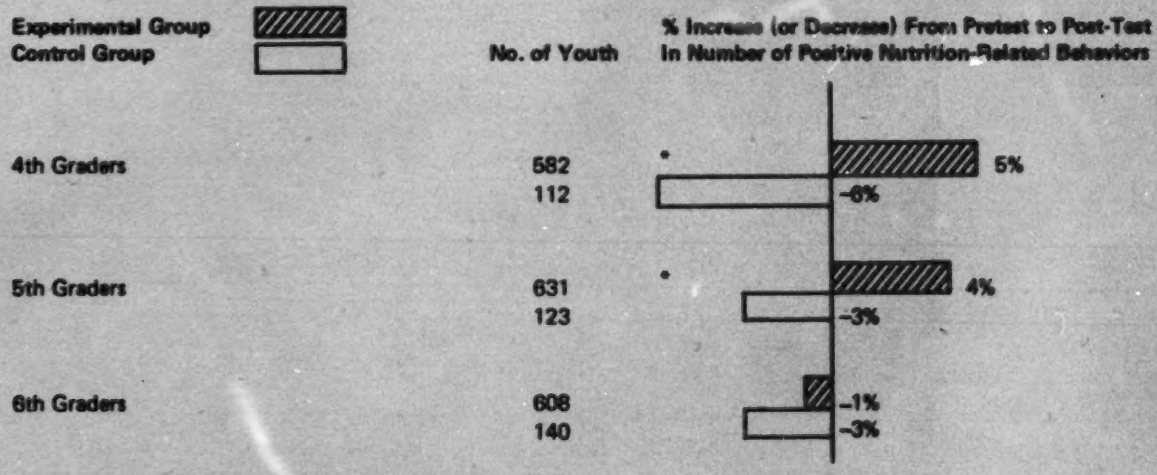


- **IMPACT FINDING -- NUTRITION-RELATED BEHAVIORS**

  THE SERIES HAS ONLY A SLIGHT IMPACT ON NUTRITION-RELATED ACTIVITIES AMONG 4TH AND 5TH GRADERS.

The measure for this impact area -- the percent increase (or decrease) from pretest to post-test in the number of nutrition-related behaviors, such as shopping for food, helping with family meals, etc. -- is presented in Chart II. While fourth and fifth graders show positive effects, these effects are not large, and 6th grade children display erratic results when the specific experimental conditions are analyzed. The most probable explanation for these results is that nutrition-related activities are not easily changed, even among younger children.

CHART II. INCREASE IN NUTRITION-RELATED ACTIVITIES

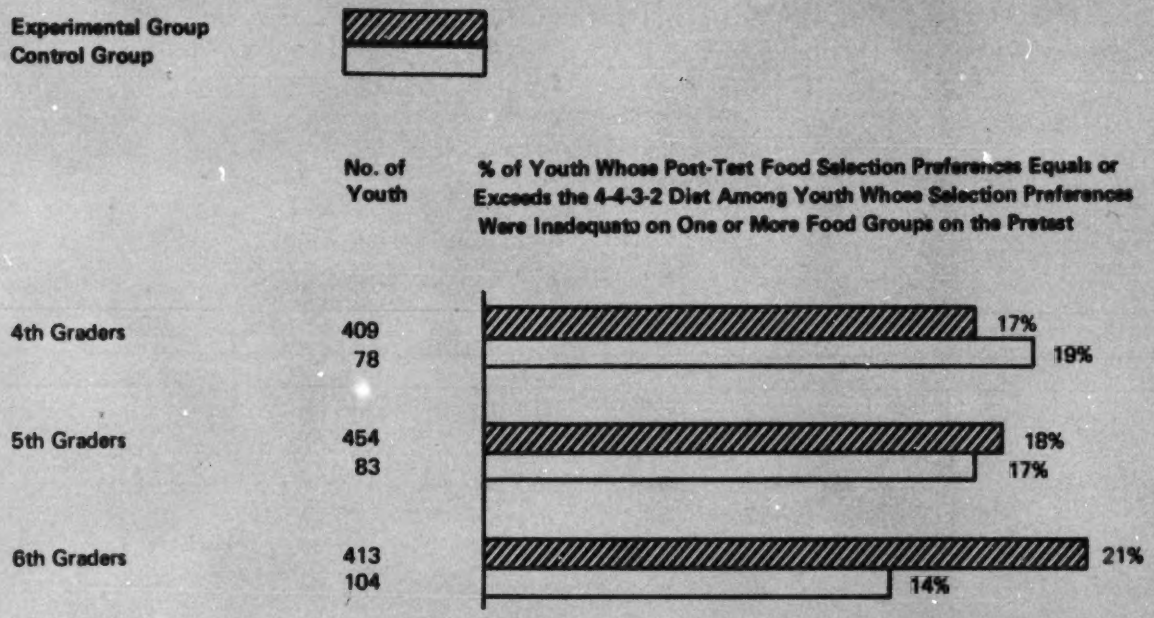


- IMPACT FINDING -- PREFERENCE FOR ADEQUATE DIETS

  VIEWING THE MULLIGAN STEW SERIES HAS NO DISCERNIBLE IMPACT ON THE DIETS THAT CHILDREN SELECTED (IN TERMS OF THE 4-4-3-2 FORMULA) WHEN GIVEN FREE CHOICE ON A MENU CONTAINING A LARGE NUMBER OF FOODS.

Two outcome measures were used as indicators of impact on youth's food intake intentions. The first of these is displayed in Chart III below: The percent of youth whose post-test preferences in food selection equals or exceeds the 4-4-3-2 diet among those whose diet preference were inadequate on the pretest.

CHART III. CHANGE TO ADEQUATE DIETS

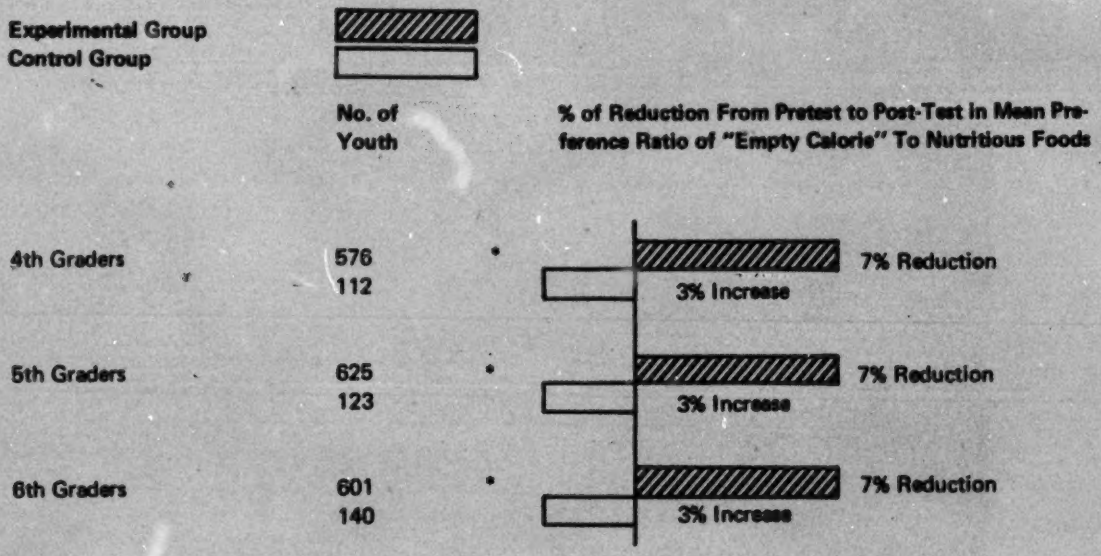


- IMPACT FINDING -- PREFERENCE FOR "EMPTY CALORIE" FOODS

  VIEWING THE SERIES RESULTS IN A PRONOUNCED REDUCTION IN THE PREFERENCE RATIO OF "EMPTY CALORIE" TO NUTRITIOUS FOODS SELECTED WHEN GIVEN FREE CHOICE OF A LARGE NUMBER OF FOODS.

The second outcome measure used in analyzing the youth's food intake intentions -- the percent reduction in the preference ratio of "empty calorie" to nutritious food selected from pretest to post-test -- is displayed in Chart IV. It appears obvious that Mulligan Stew heightens youth's awareness of "empty calorie" foods (for example, soda pop and snack chips).

CHART IV. REDUCTION IN PREFERENCE RATIO FOR "EMPTY CALORIE" FOODS

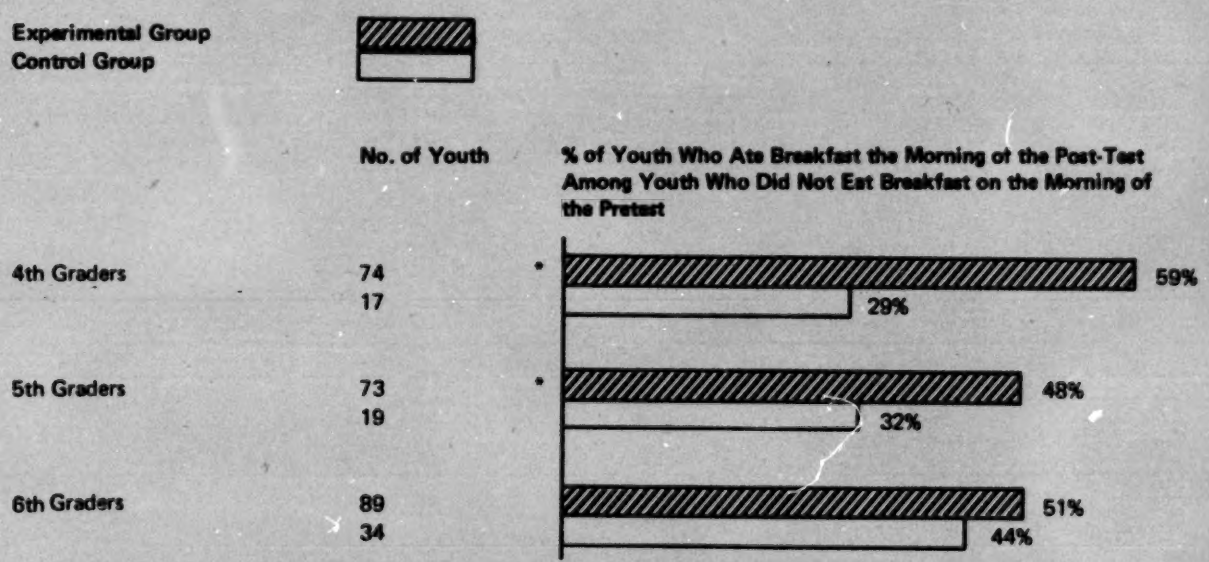


- IMPACT FINDING -- BREAKFAST-EATING BEHAVIOR

  VIEWING THE MULLIGAN STEW SERIES PROBABLY HAS A POSITIVE EFFECT IN TERMS OF INCREASING THE INCIDENCE OF EATING BREAKFAST. HOWEVER, THIS OUTCOME SHOULD BE TREATED WITH CAUTION SINCE THE SAMPLES ON WHICH THIS FINDING IS BASED IS SMALL.

The outcome measure for this impact area -- the percent of youth who ate breakfast the morning of the post-test among youth who did not eat breakfast on the morning of the pretest -- is presented below in Chart V. While there is a clear tendency for 4th and 5th grade youth who participated in the series to eat breakfast, these results should be treated cautiously because of the small samples involved.

CHART V. INCREASE IN EATING BREAKFAST

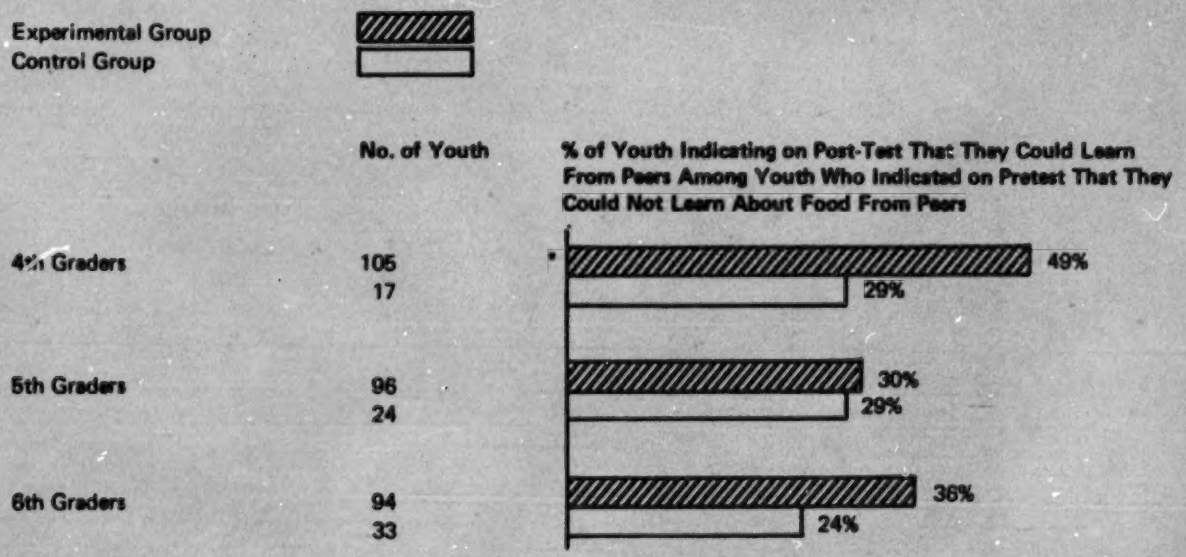


- **IMPACT FINDING -- ATTITUDES TOWARD LEARNING ABOUT FOOD FROM PEERS**

  IN GENERAL, ONLY 4TH GRADERS SHOWED DEFINITE GAINS OVER THEIR CONTROL GROUP COUNTERPARTS IN TERMS OF FEELING THEY CAN LEARN ABOUT FOOD FROM THEIR PEERS; 5TH AND 6TH GRADE YOUTH SHOWED NO SIGNIFICANT GAIN OVER THEIR CONTROLS.

This outcome measure -- the percent of youth who indicated on the post-test they could learn about food from peers among youth who indicated on the pretest that they could not learn about food from peers -- is displayed in Chart VI.

CHART VI. PERCENT CHANGE IN ATTITUDES TOWARD LEARNING FROM PEERS

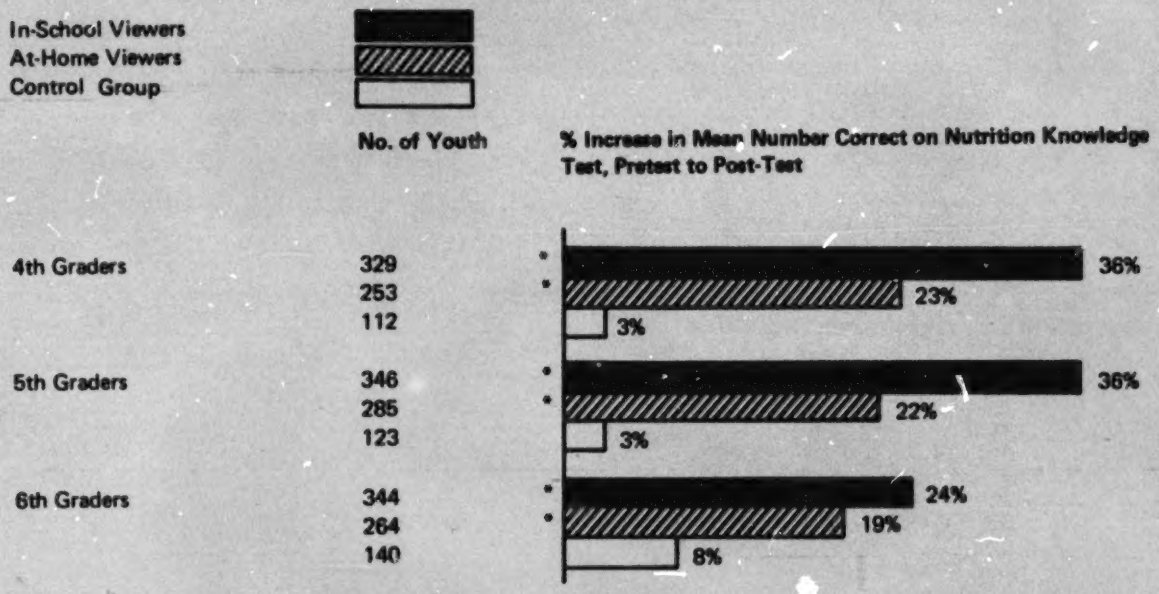


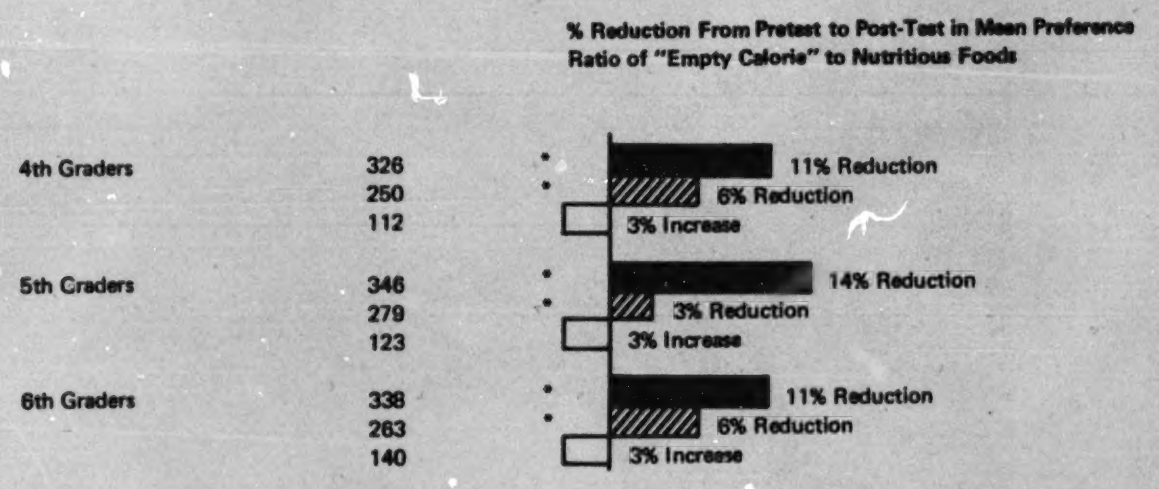
- IMPACT FINDING -- VIEWING SITUATION

  ALTHOUGH THE SERIES HAS A GOOD IMPACT IN EITHER VIEWING SITUATION, MULLIGAN STEW HAS A BETTER IMPACT WHEN CHILDREN WATCH IT IN SCHOOL THAN WHEN THEY WATCH IT AT HOME.

Evidently, the dynamics of a group viewing situation works in favor of Mulligan Stew. Some of the more dramatic data which led us to this conclusion is displayed on Chart VII below on two of our impact measures. (While some of our other measurements don't demonstrate such differences as consistently or dramatically, there is never a reversal in this trend favoring in-school viewing.) One must be cautious in drawing implications from this finding, since our experimental design did not permit us to gather data from the parents who viewed the series with their children at home or in group situations outside the school.

CHART VII. IMPACT OF VIEWING SITUATION ON SELECTED MEASUREMENTS





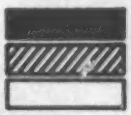
- IMPACT FINDING -- THE COMIC WORKBOOK

  THE MULLIGAN STEW COMIC WORKBOOK IS AN IMPORTANT TOOL THAT REINFORCES THE MAIN NUTRITION IDEAS PRESENTED IN THE FILMS.

While the films work well without any auxiliary materials, Mulligan Stew has a better impact when the youth are provided with the comic workbook. Chart VIII below demonstrates the differences in impact on two selected measurement areas. (While not all measurements display the comic vs. no comic differences as well as the following chart, the same finding still holds throughout the analysis.) Those youth who had the comic workbook and watched the series in school increased in nutritional sophistication more than youth in any other experimental condition.

CHART VIII. IMPACT OF COMIC WORKBOOK ON SELECTED MEASUREMENTS

With Comic
Without Comic
Control Group



	No. of Youth	% Increase in Mean Number Correct on Nutrition Knowledge Test, Pretest to Post-Test
4th Graders	309	40%
	273	20%
	112	3%
5th Graders	329	40%
	302	18%
	123	3%
6th Graders	298	29%
	310	15%
	140	8%

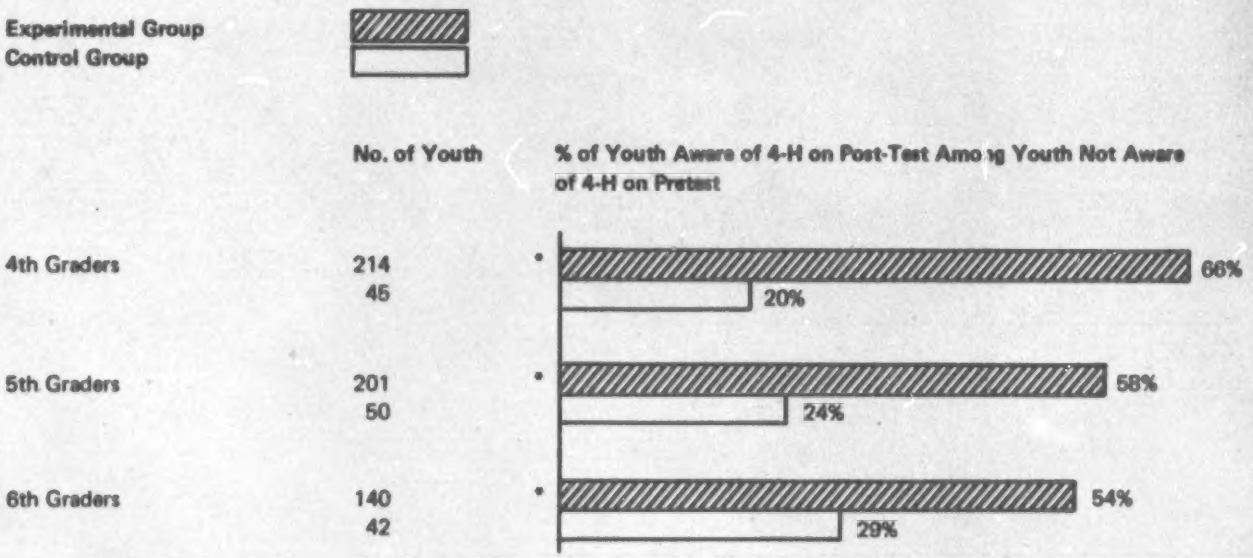
	No. of Youth	% Reduction From Pretest to Post-Test in Mean Preference Ratio of "Empty Calorie" to Nutritious Foods
4th Graders	304	10% Reduction
	272	4% Reduction
	112	3% Increase
5th Graders	326	10% Reduction
	299	7% Reduction
	123	3% Increase
6th Graders	293	10 % Reduction
	308	4% Reduction
	140	3% Increase

- IMPACT FINDING -- AWARENESS OF 4-H

  MULLIGAN STEW HAS A POWERFUL IMPACT ON YOUTH'S AWARENESS OF 4-H.

Chart IX below displays the results of this final outcome measure -- the percent increase in the number of youth aware of 4-H.

CHART IX. INCREASE IN AWARENESS OF 4-H



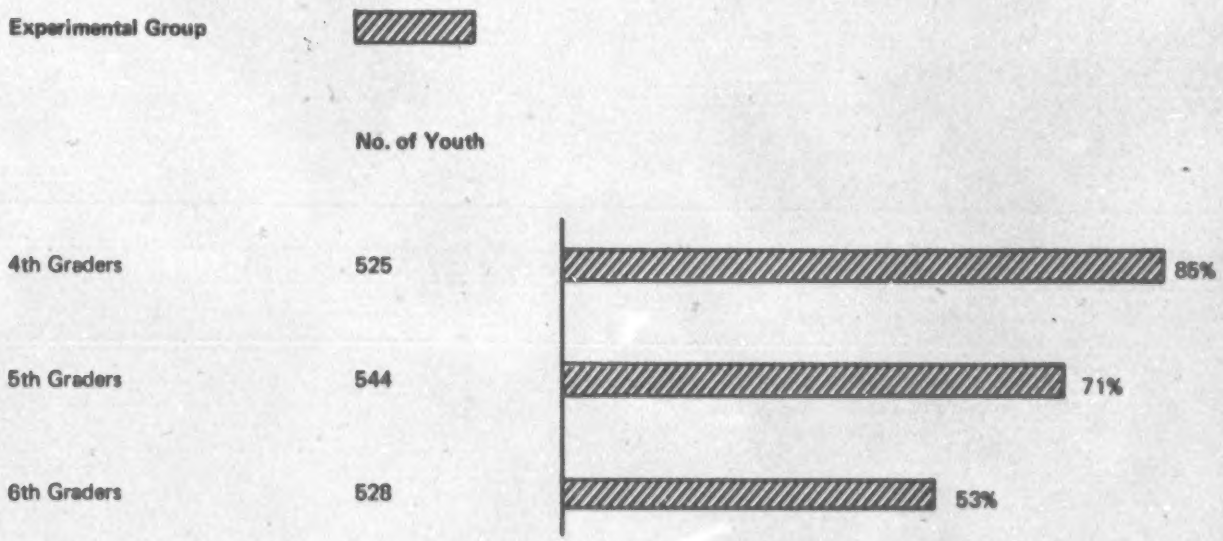
- IMPACT FINDING -- TARGET AUDIENCE

  MULLIGAN STEW APPEARS TO BE WELL TARGETED TO ITS AUDIENCE, BUT THE SHOWS SEEM TO BE MORE EFFECTIVE WITH 4TH AND 5TH GRADE YOUTH THAN WITH 6TH GRADE.

While the youth in all grades learned important facts about nutrition from watching Mulligan Stew, the 6th graders did not exhibit any notable changes in their nutrition behavior, except for "empty calorie" food selection. Charts II and V presented earlier in this chapter demonstrate this reduced impact on the sixth graders.

Further, when asked how they liked the shows, youth in the 6th grade responded less favorably, indicating that the series is more appropriate for those in the lower grades. The chart below demonstrates this pronounced difference by grade.

CHART X. PERCENT LIKING MULLIGAN STEW

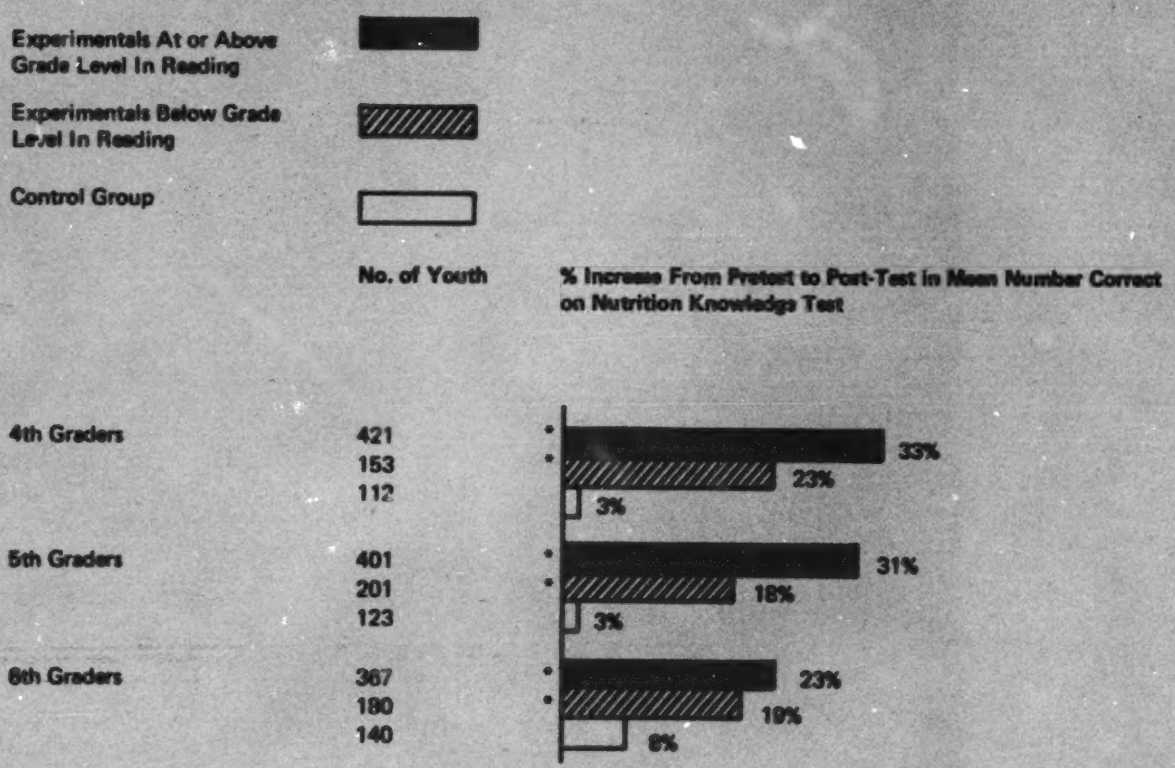


- **IMPACT FINDING -- READING ABILITY**

  "STEW" HAS AN IMPACT EVEN ON POORER STUDENTS, AS MEASURED BY READING ABILITY.

Frequently, programs will have an impact on the better student but show no effect on the poorer student. However, as measured by reading ability both good students and poorer students showed significant gains in knowledge about nutrition, as shown in the following chart.

CHART XI. INCREASE IN NUTRITION KNOWLEDGE ANALYZED BY YOUTH'S READING ABILITY

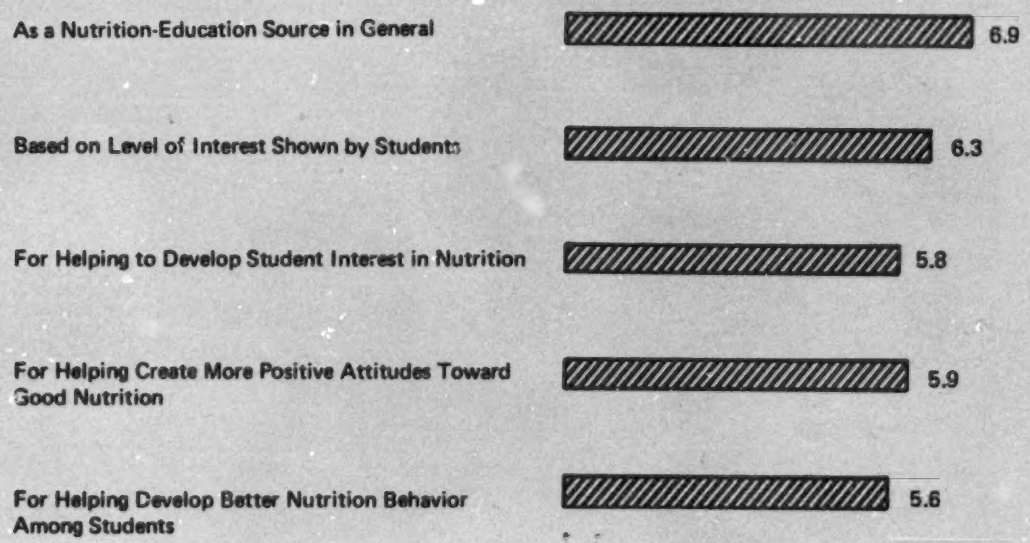


- IMPACT FINDING -- TEACHERS RATINGS

  TEACHERS ARE POSITIVE IN THEIR REACTIONS TO THE MULLIGAN STEW SERIES.

Teachers participating in this experiment were asked to rate the shows on a number of dimensions, using an eleven point scale ranging from "Very Low" (a rating of zero) to "Very High" (rating of ten). As is shown in the chart below, teachers rated the Mulligan Stew shows highest as a nutrition-education source in general", and lowest for "how much this show helped develop better nutrition behavior among your pupils". These opinions appear to be validated by the other impact findings discussed earlier in this chapter. (The data in this chart should be used with caution, however, since the sample size (N=59) is relatively small.)

CHART XII. TEACHERS' RATINGS OF THE MULLIGAN STEW SHOWS


As a Nutrition-Education Source in General
6.9
Based on Level of Interest Shown by Students
6.3
For Helping to Develop Student Interest in Nutrition
5.8
For Helping Create More Positive Attitudes Toward Good Nutrition
5.9
For Helping Develop Better Nutrition Behavior Among Students
5.6

- IMPACT FINDING -- TEACHER INVOLVEMENT

  SOMEWHAT SURPRISINGLY, THE EXTENT OF A TEACHER'S INVOLVEMENT IN FOLLOW-UP ACTIVITIES -- FOR EXAMPLE, PLAYING THE SUGGESTED MULLIGAN STEW GAMES IN CLASS -- HAS NO NOTICEABLE EFFECT ON HOW MUCH THE CHILD LEARNS FROM THE MULLIGAN STEW FILMS.

In terms of measurable growth in nutrition knowledge, there does not appear to be a marked difference among children which can be traced to the participation of their teachers in nutrition-related follow-up activities. These activities are set forth in the Teacher's Guide, which is intended as a supplement to the films. According to the content analysis, however, the Guide is inadequate in many ways, not the least of which is the fact that it rarely presents information that has not already been introduced in the films. Nor does it augment the information with additional facts or materials designed to expand the teachers', and the classes' basic understanding of the subject matter. Had the Guide included such additional material, teachers might have been more encouraged to pursue follow-up activities, with correspondingly favorable results.

- CONTENT ANALYSIS FINDING -- THE NUTRITION IDEAS PRESENTED IN THE FILMS

  THE SERIES MENTIONS ALL OF THE CONCEPTS LISTED BY THE GOVERNMENT'S INTERAGENCY COMMITTEE ON NUTRITION EDUCATION AS BEING ESSENTIAL TO NUTRITION EDUCATION, ALTHOUGH SOME CONCEPTS RECEIVE MORE ATTENTION, OR ARE PRESENTED MORE ACCURATELY, THAN OTHERS.

As with many attempts to cover a subject area completely, some ideas are presented more accurately and completely than others. A case in point, as far as Mulligan Stew is concerned, is the 4-4-3-2 concept. This is the concept identified by USDA nutritionists that an adequate diet for young people should include four servings from the bread and cereal food group,

four from the fruit and vegetable group, three from the milk group, and two from the meat group each day. Since the 4-4-3-2 concept is predicated entirely on the concept of "servings", one might expect the series to concentrate on clarifying just what constitutes a serving. While, admittedly, this is a difficult idea to present to young children, the idea behind a "serving", and what the size of a serving is, is never adequately handled at any point in the series.

The health effects depicted in the series are over-dramatized to communicate certain points. Such emphasis, however, raises the potential for miscommunication. For example, after seeing The Great Nutrition Turn On, children may conclude that one thing which can result from poor nutrition is that persons affected will fall asleep at odd times and places. Since they themselves do not do this, they may conclude that they are well-nourished.

The presentation of food additives is limited to those which are added intentionally (for preservation, enrichment and fortification). Mulligan Stew omits any mention of those added unintentionally, or for purely cosmetic purposes. Thus, children may be led to believe that all additives are for nutrition purposes alone.

- CONTENT ANALYSIS FINDING -- MULLIGAN STEW'S METHOD OF PRESENTING INFORMATION:

  ONE OF THE WEAKNESSES NOTED IN MULLIGAN STEW IS THAT SOME OF THE ATTENTION-SUSTAINING DEVICES, SUCH AS THE PUPPETS, ARE NOT EFFECTIVELY USED TO REINFORCE THE MAIN EDUCATIONAL MESSAGES OF THE FILMS.

An analysis of how the nutrition information is presented in Mulligan Stew indicates that the puppets and cartoons are often non-functional, insofar as they fail to reinforce the main points being presented.

The main presentation technique, that of repetition, does help children remember key ideas, but learning by rote can have only very limited effects.

Attention sustaining devices (e.g., rock music, kid gang, whimsy, slow motion) - are neither integrated with the educational message nor supportive of it. There is a frequent mismatch between the target audience's age and the techniques used to present information (e.g., puppets). The sound track is poor, and music and visuals tend to overpower the message.

The models create dissonance. This is particularly apparent in the modeling of Wilbur Doright, for Wilbur is presented as the authority figure who knows everything about nutrition. On the other hand, Wilbur is also the object of constant ridicule by the Mulligan Stew gang. Such contradictions would appear to be counter-productive to the objectives of the series.

The series also presents a poor model of eating behavior. Where food is concerned, the predominant visual impression is that one rarely sits down for meals. Yet considering the narrow range of food available to one who eats "on the run", this is hardly a pattern to be encouraged.

Still another problem in the modeling of the series is that the Mulligan Stew gang seem to have no families or homes -- the viewer is not told where they get their food. This "famililessness" is the most dramatic example of the tendency throughout the series to show food removed both from its normal selection and preparation, and from its usual setting -- namely, in a family environment at meal-time.

- CASE STUDY FINDING -- MULLIGAN STEW'S DELIVERY SYSTEM

  AS COMPARED TO OTHER 4-H OUTREACH METHODS, "STEW" REACHED AND SIGNED UP LARGE NUMBERS OF CHILDREN AS 4-H TV MEMBERS AT AN EXCEEDINGLY LOW COST PER CHILD.

In assessing costs for Mulligan Stew in each of the six case studies, the costs at the federal level, i.e., research and development, were not factored in. The total estimated costs for Extension Service, USDA were $716,000. The federal contribution to this effort is itemized as follows:

Comprehensive Plan	$10,000
Production	
Films	301,000
Supportive Materials	45,000
Duplication - Distribution - Reporting	346,000
Evaluation	129,231
Estimated staff time @ $25K/year:	137,500
I Development of Preliminary plan - (1 Man year)	
II Production of Films and Materials - (2½ Man years)	
III Distribution, training, promotion - (1½ Man years)	
IV Research - (½ Man years)	
National 4-H Service Committee staff time for distribution and promotion, (Administration, Professional, Secretarial, Accounting, Shipping and Billing): Fiscal year 1973	$26,000

Since 4,000,000 4-H TV members have been enrolled nationally to-date for the Mulligan Stew program, the federal contribution to the per child cost equals 18¢.

In addition, the outreach procedures used for Mulligan Stew cost the State Extension Services less than 80¢ per child; these procedures included enrolling youth as 4-H TV members. (The State Extensions' costs, by the way, do not include a substantial amount of goods and services that were donated to Mulligan Stew -- for example, free broadcast time, and volunteer time put in by teachers -- which amounted to 42¢ per youth, on the average.)

Thus, when the federal contribution is added to the State's Extension costs, the enrollment costs for Mulligan Stew amounts to less than $1.00 per youth.

To enable some rough cost comparisons with other 4-H programs to be made, USDA provided the following cost information: looking at all 4-H

costs/expenditures (including overhead costs within 4-H, but excluding overhead in other parts of Extension), the average cost per enrollee per project is $10.48. Thus, since Mulligan Stew's outreach program -- at less than $1.00 per youth -- reached such large numbers of youth, its "per youth" cost is only about one-tenth of other 4-H programs. Unfortunately, however, there was little effort to capitalize on this program by attempting to move 4-H TV members into other 4-H projects.

As of October, 1974 the six states reported that between 20% and 90% of all 4th, 5th, and 6th grade children had become 4-H TV members via Mulligan Stew. The table below details this finding:

State	Number of 4th, 5th, 6th grade children in State	Number of 4th, 5th, 6th grade children reached by Mulligan Stew	% of 4th, 5th, 6th grade children reached by Mulligan Stew*
Arkansas	112,000	103,000	90%
Missouri	270,000	171,000	60%
Oregon	N/A	N/A	-
Pennsylvania	650,000	205,224	30%
Tennessee	147,000	65,000	45%
Texas	687,000	117,000	20%

It would be interesting and appropriate for Extension Service to compare this capture rate with other programs in order to measure relative effectiveness of outreach.

*Rounded to nearest 5%.

- CASE STUDY FINDING -- IMPACT OF "STEW" ON EXTENSION SERVICE

  MULLIGAN STEW HAS IMPROVED EXTENSION'S IMAGE NOT ONLY WITH TV BROADCASTERS AND THE EDUCATIONAL COMMUNITY, BUT WITH ITS OWN AGENTS AS WELL.

Agents have reported comments from TV station personnel and from the public suggesting that they "didn't know Extension was anything but agriculture." New and potentially valuable relationships have been established with the educational community and the TV broadcasters.

In addition, Mulligan Stew has served as a morale builder for many agents who experienced success and a new sense of professional competence as a result of their involvement in the project.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Based upon our analysis of the data from the impact study, Mulligan Stew has had a positive impact on youth.

After participating in the TV series, youth demonstrate more knowledge about nutrition, are more likely to engage in nutrition-related activities, such as preparing food with a friend, and exhibit a dramatic increase in their awareness of 4-H. Since these results were identified as major goals of the series, it can be stated that Mulligan Stew has had a positive impact on its viewers.

It must be added, however, that the shows do not fully meet all of the stated objectives. For example, Mulligan Stew generates only minimal changes in the nutrition behavior of youth; while the youth who view the series do appear to eat more for breakfast, their selections from the basic four food groups (i.e., meat, milk, fruit and vegetables, bread and cereals) seem to remain unchanged.

On the other hand, the series does seem to raise youth's awareness of the concept of "empty calorie" foods -- foods that contain calories, but have little nutritional content. After participating in Mulligan Stew, youth in all three grades tended to select fewer "empty calorie" items when given free choice on a menu containing a large number of foods.

As measured by reading ability, the series works well both with the good student and the poorer student too. And while the series appears to be effective with youth in all three grades, overall Mulligan Stew has a somewhat stronger impact on fourth and fifth graders than it does on sixth grade youth.

And finally, the comic workbook and viewing situation appear to be important variables; although at-home viewing is good, in-school viewing generates larger changes; and while the series works well without the comic workbook, "Stew" is more effective with the comic.

RECOMMENDATIONS

Policy Recommendations

- WE RECOMMEND THAT TV PROGRAMMING CONTINUE TO BE USED BY THE EXTENSION SERVICE.

We have reached this first recommendation for several reasons. Firstly, Mulligan Stew has had a good impact on its target audience. And while this, in itself, does not guarantee future productions to also have a positive impact, "Stew" has amply demonstrated the ability of the TV medium.

Secondly, Mulligan Stew has created a receptive audience for Extension -- broadcasters, teachers, state and local school administration, and of course, the youth themselves.

Importantly, "Stew's" cost-effective outreach procedures does not seem to be unique to this TV series alone, but appears to be a characteristic advantage of this mass medium.

- WE RECOMMEND THAT FUTURE PROGRAM GOALS AND OBJECTIVES BE MORE CONSISTENT WITH THE POTENTIAL OF THE INSTRUMENT SELECTED TO ACHIEVE THEM.

The educational objectives and organizational objectives set for Mulligan Stew appear to have been far too optimistic, considering that the series consists of only three hours of shows, plus supplementary teaching-learning materials.

In a sense, youths are constantly being presented with nutrition information. By the time (s)he is ten years old, the average child will have had thousands of meals and snacks, will have visited supermarkets hundreds of times, and will have been given thousands or bits of nutrition information -- or misinformation -- from friends, television commercials, and box tops. If we make the conservative assumption, then, that the

average youth has received one thousand hours of "training" in nutrition from all of the above-mentioned activities, it would appear that many habits have been established even at this young age. Human behavior is not easily changed, and to expect substantial changes to be made in people's habits on the basis of a few hours of TV viewing appears to be unrealistic.

Furthermore, it would appear that objectives that emphasize establishing new habits will probably create less cognitive dissonance and, thus, will be more effective than trying to change old ones. For example, Mulligan Stew did not appear to waste its resources by emphasizing that "empty calorie" foods are bad; instead, the series emphasized why nutritious food was needed.

- WE STRONGLY URGE THE EXPANSION OF EVALUATION ACTIVITIES INTO OTHER PROGRAM COMPONENTS OF EXTENSION SERVICE.

An important use of evaluation is for policy decisions, such as the establishment of program priorities and the allocation of budgets. Unfortunately, it is difficult to compare the evaluation of Mulligan Stew with information on other programs in Extension Service to allow priorities and optimally allocated budgets to be established on the basis of current data. There appears to be a paucity of other studies within Extension Service to which to relate the Mulligan Stew findings.

TV Programming Recommendations

Should TV programming continue, a number of recommendations are in order. These concern the research and development components, and the distribution component.

Research and Development (R&D). In order to ensure high quality in future R&D efforts, the following steps must be taken:

- Select future subject areas for TV programming that satisfy at least two criteria: that the subject be of interest to both teachers and children, and that there be a paucity of high quality curriculum materials on the subject currently in use in the schools.
- Develop reasonable, realizable goals and objectives for the program.
- Operationalize these goals to a degree of specificity that makes for easy translation to the TV media, and which facilitates evaluation of the program.
- Develop auxiliary materials which both reinforce and expand on the message of the shows. Learning by doing activities should be emphasized.
- Use an R&D staff organization which includes a curriculum specialist, a subject specialist, and a TV production/film specialist. The interface between curriculum and production specialists is essential.
- Engage in formative evaluation, that is, testing the production on the target audience at all phases of the conceptualization and production. Feedback at all stages in the series development will improve all the shows as well as those later in the series.

Distribution Component. We further recommend a number of actions that will ensure smooth, cost-effective delivery of future programming efforts:

- Within a framework of limited resources, Mulligan Stew is most productively used in group situations. The group situation used in this study, i.e., schools, is not the only type of structure situation possible. Indeed Mulligan Stew can easily lend itself to a week-long nutrition camp

or be a six week segment of a 4-H club or special interest group. However, the number of children reachable through the schools is so great that this would appear to be a preferred approach. We recommend then that any future TV programming should continue to focus on the schools as its primary delivery mechanism. There must be a close working relationship between those staff who are arranging TV placement and those who are responsible for school contact and delivery of materials. The success of Mulligan Stew in any site depends on the interaction between TV schedules and school schedules.

- Lead time must be sufficient both for placement of the program and training of Extension staff. Lead time between training of Extension staff and airing of the program should be not less than two months or more than five months.

- There was little evidence of promotional activities outside of the schools. Thus, the opportunity to carry the message of the program, and thereby Extension, to a larger audience was lost. In future programming, promotion should be part of the planned activities.

- Other follow-up activities should include moving 4-H TV members into other 4-H programs. While the shows were excellent promotional as well as educational devices, their outreach potential has not been fully realized. Follow-up activities should be part of the overall planning.

A FINAL NOTE

In the past, Extension Service has subscribed to the ideal of defining in advance the specific objectives of a proposed program. Such objectives, arrived at by consensus, are very useful in identifying the limits and defining the parameters of a program. Used after the fact, as an evaluation tool, these objectives then become the criteria upon which to base a judgment as to the success of the program. The achievement of these objectives within a specified time frame constitutes "success".

The Mulligan Stew program, on the other hand, was defined in terms of generalized goals, rather than specific objectives. These goals, however, could not be automatically translated into operationalizable objectives. Thus it becomes more difficult to evaluate the success of the program in terms of any organized criteria. By recommending that TV programming of the series continue, however, Abt Associates is in fact indicating that criteria have been identified by which the success of the program may be measured. These are:

- The impact of the series: positive changes in knowledge, awareness and selected behaviors in subjects who saw the program as compared with subjects who did not
- Cost factors: the lower cost per child for the Mulligan Stew package compared with the cost per child for other 4-H programs
- The continued interest expressed by state 4-H staff, teachers, principals, and TV stations in additional 4-H TV programming.

Even though these criteria were arrived at after the fact, they would appear to be appropriate, and the data acquired by Abt Associates for evaluating the program on the basis of these criteria would allow a valid judgment of the success of Mulligan Stew to be made.